

## A DISTRIBUTED MODEL FOR TEACHER MENTORING: BROADENING THE LEARNING COMMUNITY

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As the end of August rolled around sixteen years ago, I became familiar with the anxiety and fears that grip many novice teachers as they approach that first "year of tears" in the classroom. I felt vulnerable, waiting for somebody to discover the insecure and awkward teacher behind my best attempts at a smokescreen. I was comforted to know, however, that along with my other first-year colleagues in the district, I was enrolled in an induction program intended to guide my beginning forays into life as a teacher.

At the first meeting of the program, I joined some 100 other beginning teachers in a large lecture hall. I received a notebook with "model" lesson plans, strategies for classroom management, questionnaires to answer and share with my "mentor" every few weeks, a list of goals and objectives for my first year of teaching, and a schedule of the mentoring activities throughout the year. Although my intuitions had already sniffed a setup, I engaged in the program with hope that it would foster a more confident and experienced teacher.

As the semester unfolded, my mentor and I met before school once or twice a month. He was gracious with his time, a willing supplier of recommendations and teaching tips, and welcomed me into his classroom to observe his teaching. The program even allowed us to spend one day visiting schools in our community and, observing the "master" mathematics teachers in the district. The program appeared to be efficient and structured and, promised a full measure of teaching tips to put me on the fast track of teaching competence. Or so I thought.

During the first few weeks, I had tired of the charade. The lesson plan templates were not helpful, the weekly journal questions were canned, I wasn't feeling any better about the quality of my teaching and had a growing suspicion that I would never be (nor want to be) the teacher to which this program would have me aspire. Meeting the program requirements soon became a burden.

Now, many years and experiences later, I realize that the mentoring program I experienced was at best shallow, if not damaging to my early growth as a teacher. Numerous examples in the research literature portray professional development of this kind as only moderately successful at best (Cohen & Ball, 2001). These programs tend to be "top-down" in nature, based on the assumptions that good teaching practices can be quantified and packaged and that professional development can be streamlined to avoid or minimize the complexities of the learning-to-teach process (Greeno & Goldman, 1998).

This article examines an innovative way of conceptualizing mentoring and develops the notion of a "distributed" model of mentoring, backed by snippets from one professional development program that has sought to use the context of community to broaden the definition (and success) of mentoring for mathematics teachers.

### Theoretical Considerations: Perspectives on Mentoring

Literature on the tradition of the "apprenticeship" model of teacher learning contains numerous descriptions of the roles and functions of the mentor (Halai, 1998). The mentor is seen as an "expert" (Barab & Hay, 2001), as a "modeler" (Moran, 1990), and as a "coach ... facilitator ... role model ... [and] supporter" (Semeniuk & Worrall, 2000). Many of these conventional approaches to and metaphors for mentoring have been based on Little's (1990) notions of mentoring that emphasize technical advice, emotional support, and practical suggestions and that "the presumption of wisdom ... [and] accumulated knowledge that can serve as the basis of sensitive observation, astute commentary, sound advice" (p. 316). Feimen-Nemser and Parker (1992) built upon these assumptions to advocate three perspectives that define the mentor as local guide, educational companion, and agent of change.

Jacobi (1991) asserts, there is an "absence of a widely accepted operational definition of mentoring" (p. 505). However, there appears a general consensus that mentoring is an effective way to ease beginning teachers into the profession and provide opportunities for inservice teachers to develop their craft knowledge and diminish isolation by promoting conversations about teaching with knowledgeable others (Semeniuk & Worrall, 2000). It is



noteworthy that the promises of mentoring are most often attributed to the mentor. It implicitly assumes mentoring as a form of apprenticeship relationship in which the "expert" mentor has the knowledge and expertise to offer while the novice is the beneficiary of this relationship in order to move forward.

However, such a definition of mentoring may not be helpful because of the different roles that mentor and novice play. I propose a broader definition of mentoring through engaging the following questions: Can novice teachers mentor their mentors into a deeper way of thinking? Can novices mentor one another? How might the dynamism of a community of teachers act as a mentor for all?

These questions emerge in part from recognition that the landscape of today's mathematics classroom is much more uneven and demanding for teachers than in the past. Whereas the induction models of 15 years ago may have been intended to get teachers "up to speed" and independent as rapidly as possible, teacher educators of today have a much wider list of considerations and expectations as they help teachers understand and implement reform-based ideas and curricula. Now teachers must learn *how to learn* mathematics as they teach programs that depend on rich contexts and conceptually based content. They must learn how to deal with mathematical uncertainty—both their own and their students'—because reform-based curriculum programs are much less likely to lead students through guided practice of convergent procedures and algorithms and, instead, favor open-ended problem contexts that elicit multiple solution strategies and approaches (Frykholm, 2004). They must know how to lead mathematical conversations that take twists and turns in real time as students build understanding on the ideas of their peers. It is these kinds of tasks, for which there is no script, that now rest at the heart of teacher professional development and it is toward these ends that there has been growing advocacy in the literature to apply sociocultural theories of learning to professional development efforts in mathematics education.

### Emerging Sociocultural Views of Teacher Learning

A growing number of theorists and researchers have promoted situative views of teacher professional develop-

ment. If we assume teacher learning is situated in context, then how a teacher learns a particular set of knowledge and skills and the situations in which a teacher learns are fundamental to what is learned (Greeno, Collins, & Resnick, 1996). Similarly, teacher learning can be helpfully understood as "a process of increasing participation in the practice of teaching, and through this participation, a process of becoming knowledgeable in and about teaching" (Adler, 2000, p. 37).

Several years ago, I had likewise begun to research the power and promise of learning to teach mathematics in community guided with this perspective (Frykholm, 1998). It is this perspective—a broad recognition of the importance of situative views of learning—that I believe makes room for a reconceptualization of both the definitions and the roles for teacher mentoring.

### A Distributed Model of Teacher Mentoring

In this article I propose a way of thinking about teacher mentoring that reflects a desire for the "self-sustaining" and "generative" teacher, while at the same time attending to the compelling evidence that teacher learning is necessarily situative.

To sustain this new way of thinking about teacher mentoring, I describe a professional development program that attempted to both broaden and "distribute" the tasks that would typically fall under the auspices of the "mentor." Along the way, I address the issues about *when* mentoring was taking place, *how* it was occurring, who the *agents* of the mentoring were, and ultimately, how successful this distributed and communal approach has been for promoting teacher's "self-sustaining" and "generative" growth and development. After describing the program I briefly suggest several principles that might lead to a potentially new conception of teacher mentoring.

### Distributing the Role of the Mentor: Snapshots From the STAAR Project

For nearly two years, a research team at the University of Colorado has worked closely with a cohort of middle grades algebra teachers in a project called "Supporting the Transition from Arithmetic to Algebraic Reasoning" (STAAR). For two consecutive summers, the STAAR

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Project provided 60 contact hours of instruction in an institute designed to strengthen teachers' understanding of central algebraic concepts and help them explore ways of fostering their students' algebraic thinking. These two-summer institutes were supplemented by 12 full-day meetings across two school years, in which participants pursued individual goals for their teaching in the context of the professional workshops. Between the workshops, the research team made multiple visits to the classrooms of each participant, videotaped class periods, and subsequently made these records of teaching practice available to the teachers for their own reflection at the workshops.

Four primary goals guided the STAAR Project, which include (1) supporting the development of teachers' knowledge of algebra, (2) supporting the development of teachers' knowledge about the teaching of algebra (e.g., innovations in curricula, pedagogical strategies, research on student thinking, etc.); (3) creating a professional learning community; and (4) providing an opportunity for teachers to learn mathematics in a reform-oriented setting.

These goals were pursued in various ways. The facilitators of the workshops prompted participants to work on various mathematical tasks, use videos and other research records to illuminate student thinking about algebra, and share actively the videos from their own classrooms that highlighted aspects of their practices, their goals for improvement, and their reflections about teaching mathematics.

Central to these pursuits was what the research team termed the Problem Solving Cycle (PSC), in which a particular mathematical concept was first explored in the context of the STAAR workshops and then taught by each participant. Video records of these lessons were then used to foster discussions about the various ways the teachers implemented the problem in their own classrooms and the content and quality of student discussions on the particular problem context.

The Problem Solving Cycle of the STAAR professional development program was developed and elaborated around four primary themes. They are community, content, student thinking, and pedagogy. Within these four structures

emerged opportunities for a blended and distributed form of mentoring to occur.

### **Community**

One of the primary goals for the STAAR was to cultivate a community of teacher-leaders that would extend beyond the completion of its professional development component. Great care was given by the research team to create a community with a positive environment in which teachers would feel comfortable enough to critique the ideas and practices of others and feel safe enough to reveal their own insecurities, questions about teaching and learning, and video records of their classrooms with their peers.

As the program unfolded, the teachers came to highly value these opportunities for collaborative reflection on their teaching practice and the nature of the conversations among the group continued to deepen. Teachers freely spoke about their "disasters" in the classroom, as well as the growth and successes they were realizing. By the final workshop of the first year, teachers were able to share summaries of their growth and development pertaining specifically to the goals that they had nurtured throughout the year with the help of their colleagues. As one might expect, the sharing of video excerpts from the participants' own classrooms proved to be a rich context to promote teachers' conversation, trust, and growth.

### **Content**

At the root of the PSC was rich mathematical content intended not only to be introduced in the classrooms of the teacher but also as a context to stretch the mathematical (algebraic) understanding of the teachers themselves. Drawing from a wide array of sources including contemporary middle school textbook materials, the facilitators engaged teachers in working on mathematical tasks in each gathering to emphasize the algebraic content focus of the program. Typically, the teachers would explore the content first in solo, then with a partner or small group, and then as a whole group, from which rich discussions about the mathematics would arise.

After the mathematics content had been thoroughly discussed, the participants turned their attention to ways they might implement such content in their own classrooms.



They were asked to incorporate elements of their personal goals into their lesson planning, such as asking open-ended questions or soliciting multiple solution strategies. To complete the cycle, the lessons the teachers taught were videotaped and brought to the subsequent gathering for comparison and analysis. Through these phases of the PSC, the research team tried to maintain a clear focus on the mathematics and on the issues involved in helping the teachers broaden their own understanding of fundamental algebraic concepts and connections.

### **Student Thinking**

Early in the program, many of the participants indicated an interest in focusing on student thinking. To address this issue, teachers were reminded to focus on student thinking as they themselves grappled with the mathematics.

The parallels between the thinking and solution strategies they were discussing with their peers and the thinking of their students became obvious. This recognition, however, also became a focal point of conversation when one of the facilitators reminded the participants that the intuitions and mathematical thinking of young learners can often be powerful agents of change for teachers if they are conditioned to listen carefully.

In short, the program came to view student thinking itself as a powerful agent for influencing teacher change. When encouraged to be mindful about their student thinking and when given the opportunity to examine the video teaching records of their peers for nuances to be found in student thinking, teachers were compelled to examine their assumptions and teaching strategies.

### **Pedagogy**

The final goal for the STAAR was to improve teaching from a pedagogical point of view. In some way, the individual goals pursued by each of the teachers and the goals and structure of the program itself were all linked to mathematics pedagogy, a natural focal point of conversation and a target for the research team.

Early in the program, the facilitators offered four questions that would become anchors for the teachers as they viewed videotapes and prepared lessons: (1) What mathematical understandings does a teacher need to

design and carry out this lesson? (2) What roles are students asked to play in the lesson? (3) What is the teacher's role throughout the lesson? (4) What interaction patterns populate the lesson? These questions emerged in each of the professional development workshops in various forms.

### **Concluding Thoughts:**

The STAAR Project has sought to broaden both contexts and agents for teacher mentoring. The project is generating empirical evidence for three assumptions that may be foundational for developing conceptualizations of mentoring.

The first assumption is that the professional program needed to create as many contexts as possible for relationships and interactions that would typically be associated with acts of mentoring. As in our example, the program participants found themselves in conversations with others around real episodes of teaching at different levels. These conversations took place in large groups about mathematics, mathematics teaching, and learning. They also took place in small groups as participants shared and critiqued video records of practice. In addition, they took place as teachers talked with partners about their goals for teaching, their struggles in the classroom, and their celebrations. In a related sense, we also took advantage of what might have appeared to some to be unlikely sources of mentoring such as viewing examples of student thinking as educative and formative agents for teachers' development.

The second assumption is that a healthy and vibrant community of learners could not only act as a proxy for a mentor but also actually exceed what one might expect from a single mentor given the multitude of perspectives and interactions afforded by participation in a community. The snippets of data shared in this article were selected from a multitude of others that could have similarly illustrated the depth of the community in this program and the ways in which teachers leveraged the trust of their colleagues to both nurture and inspire one another toward better teaching practices. This feature of the learning community was most notable when teachers were sharing videos from their classrooms, debriefing their goals, and discussing their aspirations with peers.



Finally, teachers might best experience self-regulated and generative professional growth if they were not simply being mentored but simultaneously being held to the expectation that they act as mentors to their peers as well. This assumption most directly challenges the more traditional notions of mentoring described in the literature. When providing insight for, critiquing lessons of, listening to, and encouraging other teachers like a mentor, teachers were pushed to think and act from a position they would never have assumed otherwise. The project facilitators may have initially been viewed by the participants as the holders of knowledge about mathematics teaching and learning. Quickly, the teachers embraced the idea that they were co-mentors for one another and responsible for fertilizing the ideas and goals of their peers.

It is this notion of mutual mentoring that I believe deserves attention from mathematics educators and researchers. As with any professional development program, the question of scalability remains. Generating positive mentoring experiences for a few individuals is not difficult but it is unlikely to impact teaching practices in our school classrooms in a large scale. It is only when teachers are given time and models to begin mentoring one another in their communities, their schools, and with their close colleagues that we might begin to expect generative change. It is my hope that this article will add fuel to the conversations and the theory building of other mathematics teacher educators who are similarly interested in extending meaningful mentoring experiences for teachers across their long careers.

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